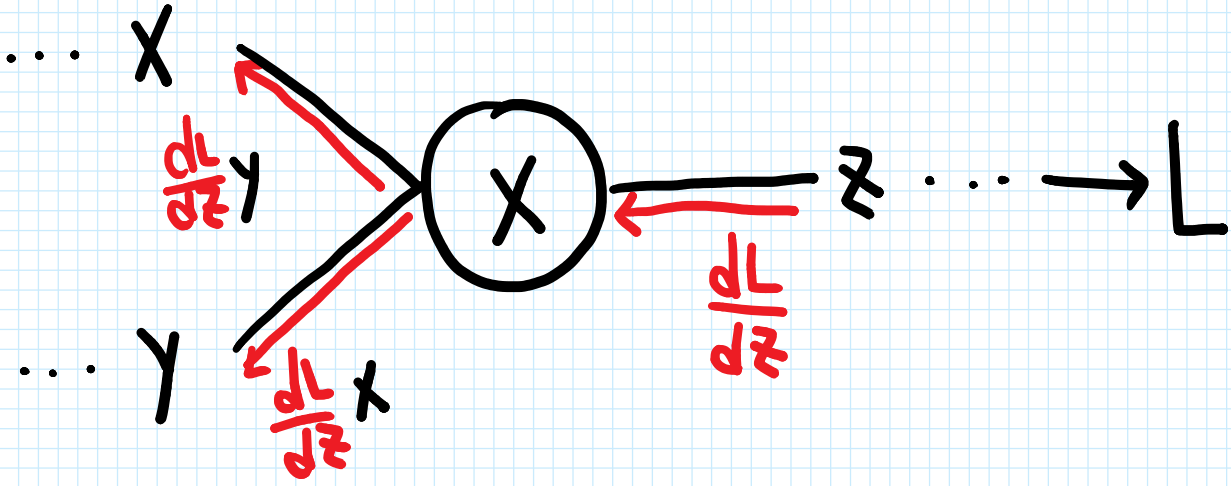
Day 4

2018년 10월 18일 목요일 오전 9:24

$z = xy \qquad \frac{dz}{dx} = y, \ \frac{dz}{dy} = x$

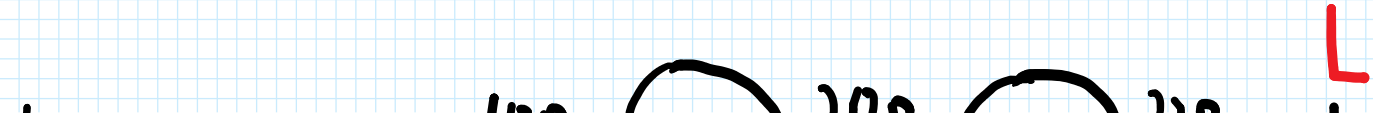


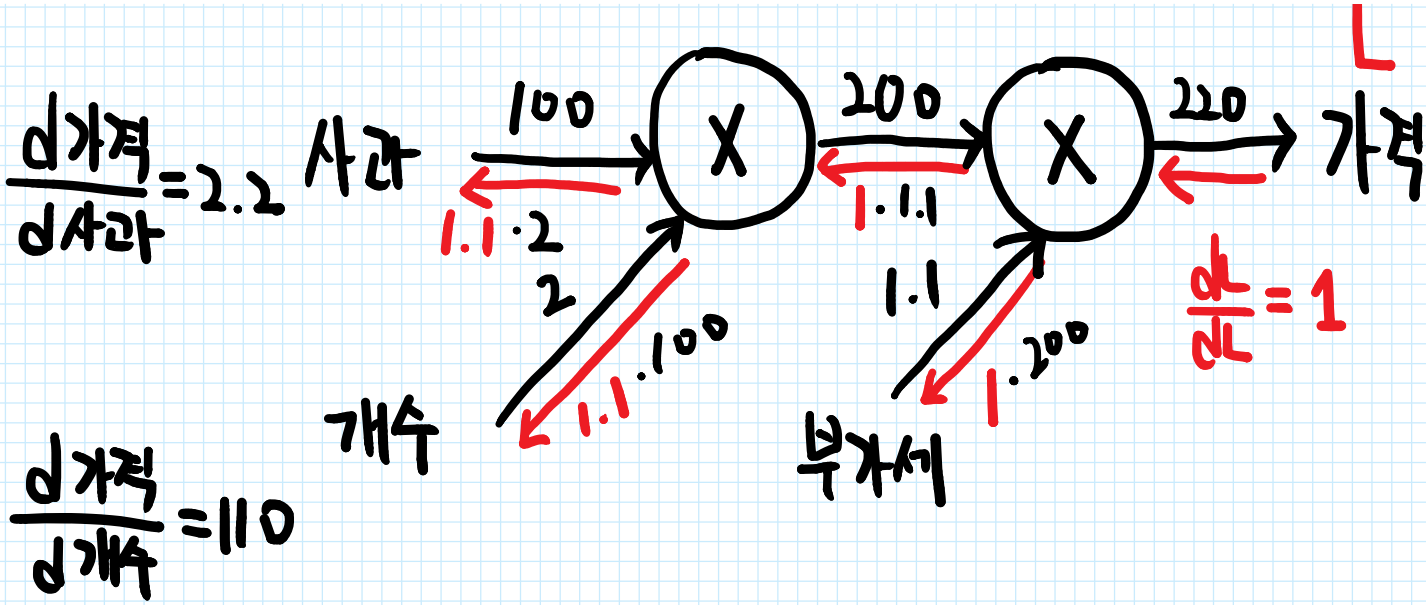
$$\frac{dL}{dx} = \frac{dL}{dz}\frac{dz}{dx}$$

$$\frac{dL}{dy} = \frac{dL}{dz}\frac{dz}{dy}$$

가격 = (사과 x 개수) x 부가세

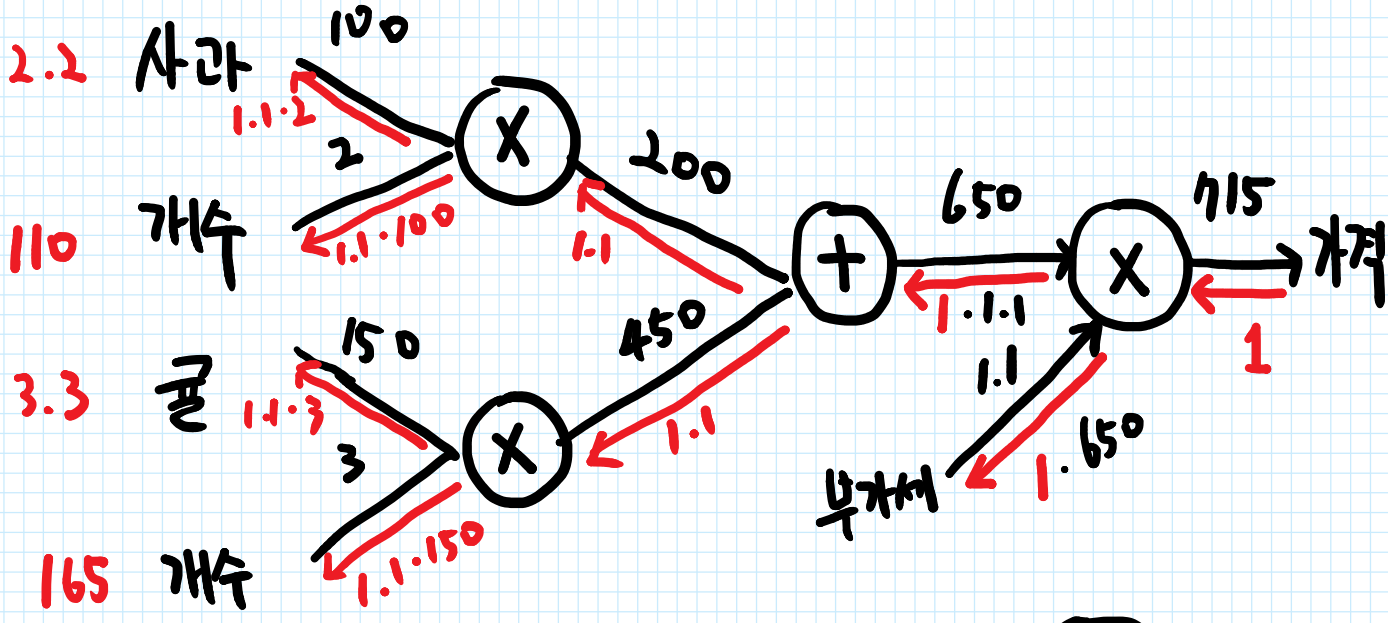
220 = (100 x 2) x 1.1

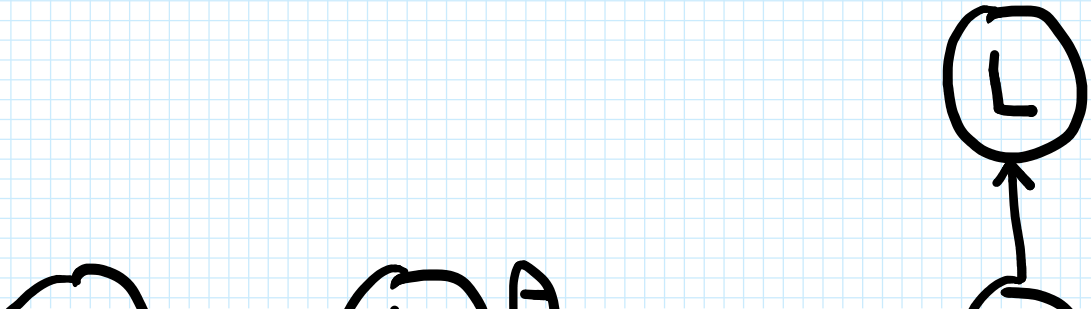


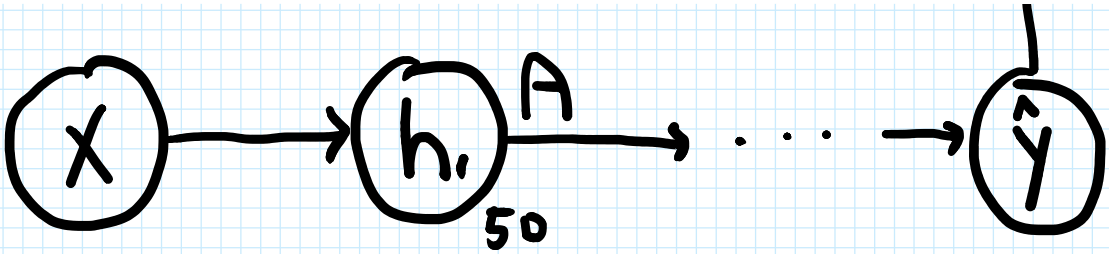


$$가격 = \{(사과 \times 개수) + (귤 \times 개수)\} \times 부가세$$

$$715 = \{(100 \times 2) + (150 \times 3)\} \times 1.1$$



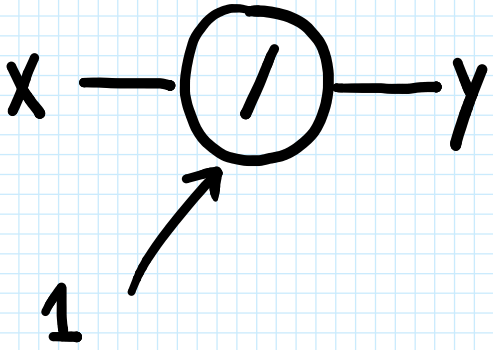




$W^{(1)}$

$b^{(1)}$

$$A(X \cdot W^{(1)} + b^{(1)})$$



$$y = \frac{1}{x}$$

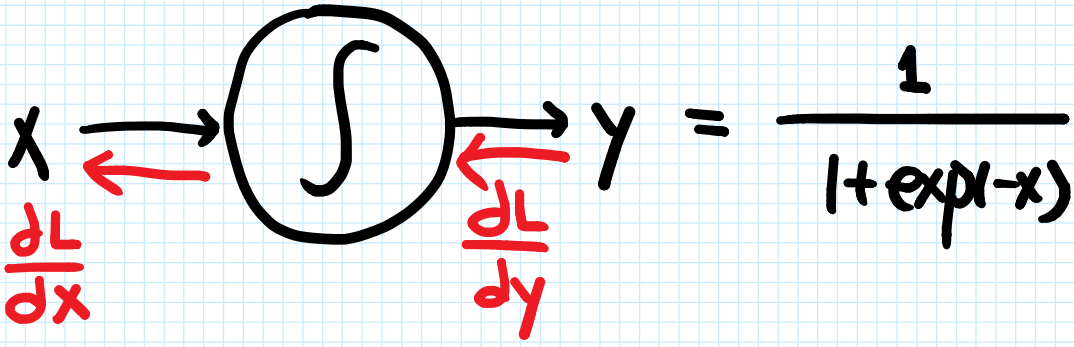
$$\frac{dy}{dx} = -\frac{1}{x^2}$$

$$= -\left(\frac{1}{x}\right)^2$$

$$= -y^2$$

$$y = \exp(x)$$

$$\frac{dy}{dx} = \exp(x)$$



$$y = \frac{1}{1+\exp(-x)}$$

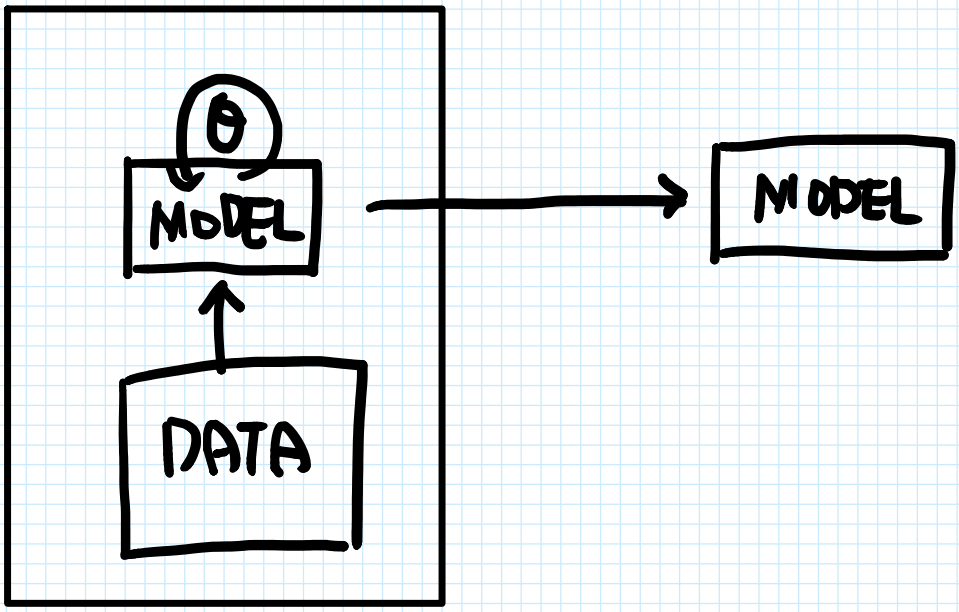
$$\frac{dL}{dx} = \frac{dL}{dy} y^2 \exp(-x)$$

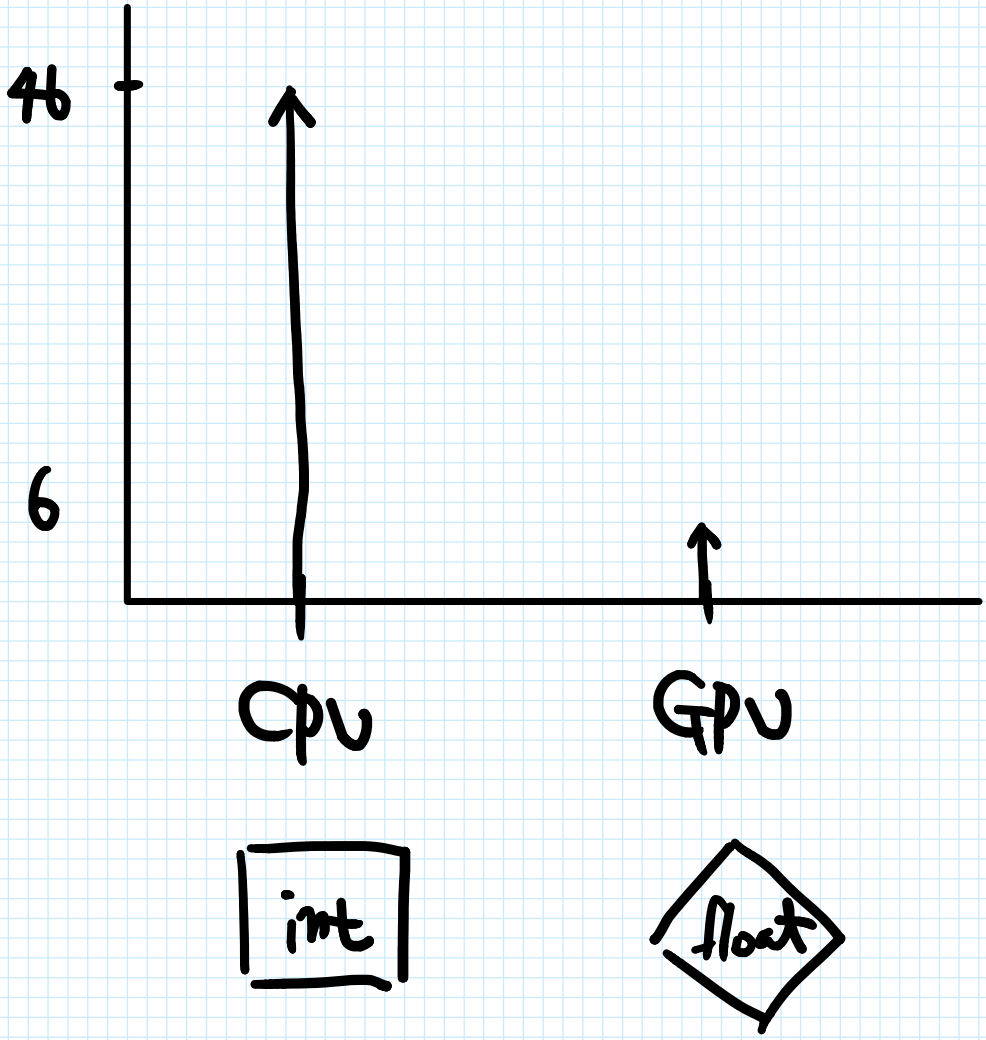
$$= \frac{dL}{dy}\left(\frac{1}{1+\exp(-x)}\right)^2 \exp(-x)$$

$$= \frac{dL}{dy} \frac{1}{1+\exp(-x)} \frac{\exp(-x)}{1+\exp(-x)}$$

$$= \frac{dL}{dy} y(1-y)$$

Training Center App


θ
MODEL
DATA
MODEL


46
6
CPU
GPU
int
float

훈련횟수 % 에폭당 반복수

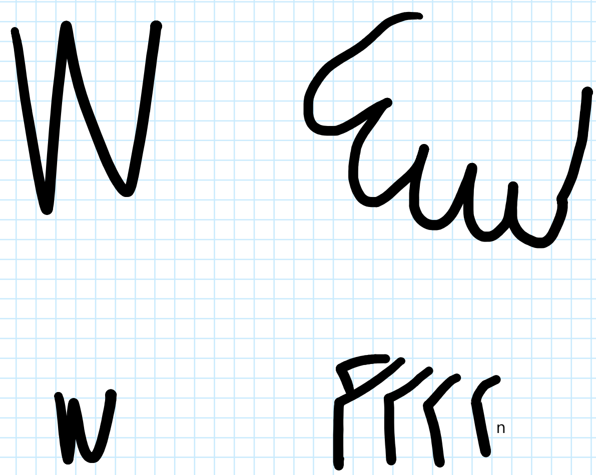
600 → Loss

1200 → Loss

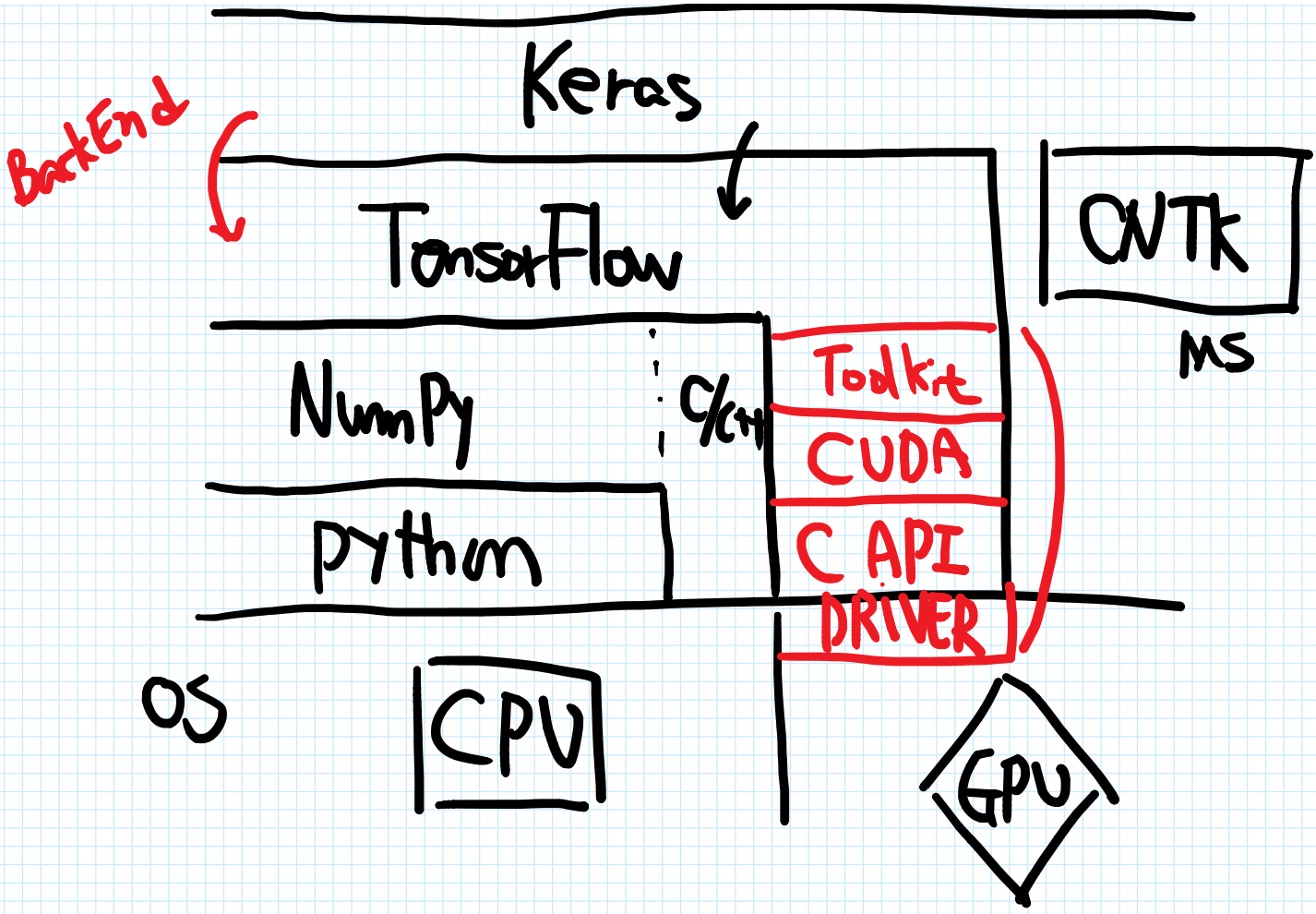
1800 → Loss

$X \cdot W + b$

if $W=0$, $b=0$ → 0

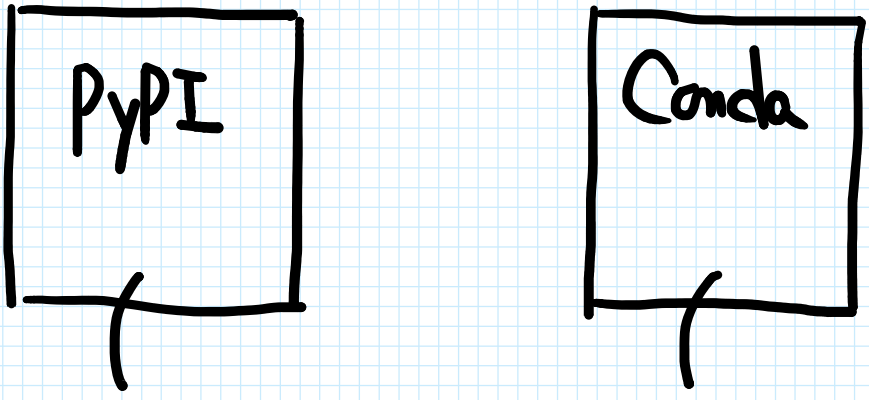


Keras



Python Package

라이브러리

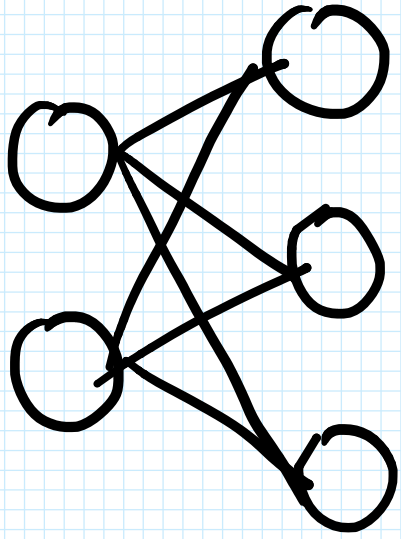


$ pip install pkg

$ conda install

$X \cdot W + b$

수학: Affine 변환



신경망: 완전연결 Dense

```
model.summary()
```

```
_________________________________________________________________
Layer (type)                 Output Shape              Param #
=================================================================
dense_1 (Dense)              (None, 50)                39250
_________________________________________________________________
dense_2 (Dense)              (None, 100)               5100
_________________________________________________________________
```

#샘플수

784 x 50 + 50 = 39,250

50 x 100 + 100 = 5,100

60k

```
history = model.fit(X_train, Y_train,
                    epochs=200, batch_size=100,
                    validation_split=0.2)
```

```
Train on 48000 samples, validate on 12000 sample
s
Epoch 1/200
48000/48000 [==============================] - 1
s 17us/step - loss: 2.3017 - acc: 0.1231 - val_l
oss: 2.2790 - val_acc: 0.2206
Epoch 2/200
48000/48000 [==============================] - 1
s 14us/step - loss: 2.2629 - acc: 0.1947 - val_l
oss: 2.2473 - val_acc: 0.3013
```

Mini Batch

Epoch